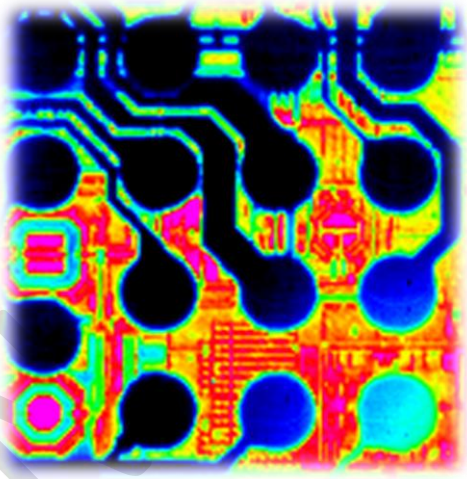
WiDy SWIR 640U-S



Wide Dynamic Range up to 140dB

Near Infrared Imaging (900 - 1700nm)

640 x512 Pixels Resolution

Ease your design with Native WDR™

Key Features

- **Native WDR™:** Intrinsic wide dynamic range
  – no knee points to setup or multiple exposures
  – 140 dB in a single shot.
- **High QE InGaAs global shutter**
  (900nm to 1700nm) & in pixel CDS *NEW*
- **VGA resolution , 640*512 effective pixels,**
  15 µm square pixels
- **User friendly windows based (GUI) *NEW***
- **USB 2.0 interface for power and data transfer**

Applications

- **Industrial NIR imaging**
  (pharmaceutical, food, welding…)
- **Laser instrument**
- **Semiconductor**
- **Agricultural**
- **Process Control**

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San Francisco, CA 94127 USA
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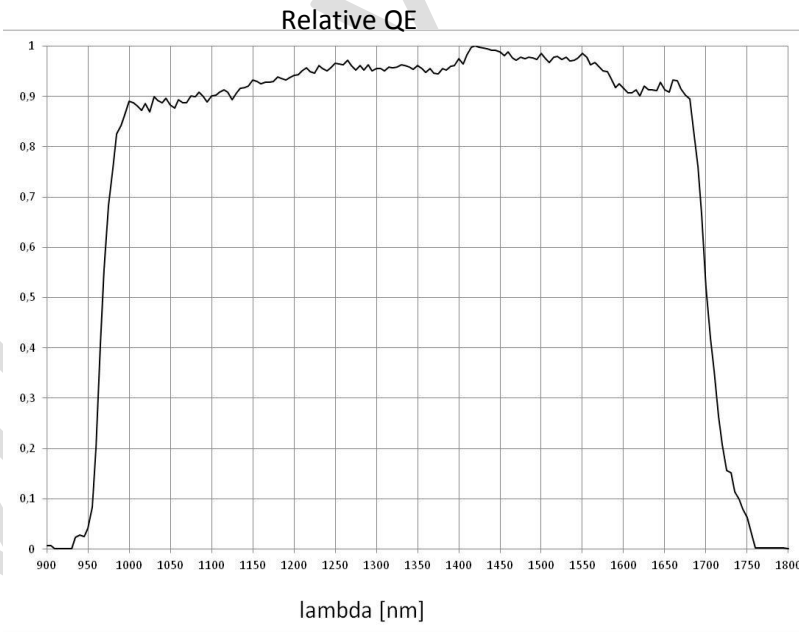
PRELIMINARY

WDR
InGasAs NIR Camera
VGA resolution

WiDy SWIR 640U-S camera makes use of new sensor NSC1201-SI (VGA, global shutter), delivers digital videos via USB 2.0 interface and can be triggered. It is delivered as a turn-key package including camera, cables and a new software **WiDyVISION** package with more functions allowing thus a quick and easy integration in any equipment or vehicles platform.

Technical Specifications

- **Sensor:** NSC1201-SI
- **Resolution**: 640x512 pixels
- **Operating mode:** Global shutter
- **Materials:** InGaAs
- **Pixel size:** 15umx15um
- **QE:** 80%
- **Dimensions:** 49 * 49 * 33 mm
- **Data output** : 14 bits USB 2.0
- **Dynamic Range:** >140dB
  Logarithmic response
- **Lens mount :** CS /C mount
- **A/D converter:** 14 bits
- **Frame rate:** up to 60 fps
- **Compatibility** Windows XP/Win Vista/7/8
- **Operating Temp:** -40°C to + 70 °C



WiDyVISION Software

PRELIMINARY

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WiDy SWIR 640U-S

User's manual

Nov. 2014 – V1.0

*Products and specifications discussed herein are for evaluation and reference purposes only and are subject to change by NIT without notice.
Products are only warranted by NIT to meet NIT's production data sheet specifications.

Features

- **High QE InGaAs from 900nm-1.7µm**,
- **VGA Resolution , 640 x 512 effective pixels,** 15µm square pixels, 12.3mm diagonal
- **High Dynamic Range** thanks to its patented Solar Cell pixel structure: 140 dB – no illumination saturation
- **Native WDR™:** Intrinsic wide dynamic range - no knee points to setup – no multiple exposures – 140 dB in a single shot.
- **Single USB 2.0 output** - compatible with Windows OS (driver Vista, 7.0, 8.0)
- **Ease of Use** – Delivered with GUI WiDyVISION
- **Low power consumption and small form factor**

Applications

- Industrial NIR Imaging (pharmaceutical, food, welding …)
- Laser instrumentation
- Semiconductor
- Agricultural
- Process Control

Key Performances

Sensor	NSC1201-SI
Resolution	640 x 512 pixels
Operating Mode	Global shutter (Snapshot)
Materials	InGaAs
Pixel size	15um x 15um
QE	80%
Dimensions	49 x 49 x 33 mm
Output	USB 2.0 14bits
Camera Interface	USB 2.0
Dynamic Range	>140dB – Log response
Lens mount	CS/C Mount
Frame rate	Up to 60fps
Power Consumption	<1,5W
Operating Temp	-40°C +70°C
Weight	<125 gr

Ordering information

9SMC1201IY31UC0E : “WiDy SWIR 640U-S”

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Thank you for purchasing the WiDy 640U-S InGaAs camera.

This user's manual details the features, functions and interfaces of your camera. The WiDyVISION software document is also available for detailed interface. Please contact support team at info@new-imaging-technologies.com for more information.

Important: *NIT reserves the right to change products or specifications without notice.*

1 CAMERA POWER UP REQUIREMENTS

1.1 Power Up requirements

The WiDy 640U-S is designed against damage from high voltage surge. However we recommend that you do to not use a voltage higher than 5V to ensure proper operations. All connections must be done before applying power. We recommend the USB power supply cable delivered with the camera.

1.2 Cleaning information

Care is required when installing a new lens to prevent dust from entering the mount opening. However, if dust is present on the sensor window surface, you may clean the imager surface using cleaning materials. Acetone liquid and microfiber tools are recommended for removing dust and cleaning the sensor window.

2 CAMERA FUNCTIONS

The WiDy SWIR 640U-S camera is a Near InfraRed camera (900-1700nm) especially designed for users in the industry, laser and process control domains whom are looking for Wide Dynamic Range, VGA resolution, reliable and ease of use solution in NIR imaging. WiDy SWIR 640U-S camera makes use of NSC1201-SI sensor, delivers video signal in digital 14 bits via USB 2.0 interface. It is delivered as a turn-key package including camera, software tools and cables in shock proof case allowing thus a quick and easy integration in any equipment platform.

Figure 1 - WiDy SWIR 640U-S with CS/C mount adaptor

The WiDy SWIR 640U-S camera offers the following functions:

- Different set-up possibilities through camera control
  - Frame rate
  - Exposure time
  - Trigger external or internal
- Image post processing
- Customized Non Uniformity Correction* : 2 points NUC, Bad Pixel Correction
- Recording

3 CAMERA ASSEMBLY

3.1 Camera Layout

The camera is assembled with multipart aluminum housing. 3 main elements compose the cameras, as described in the following figure:

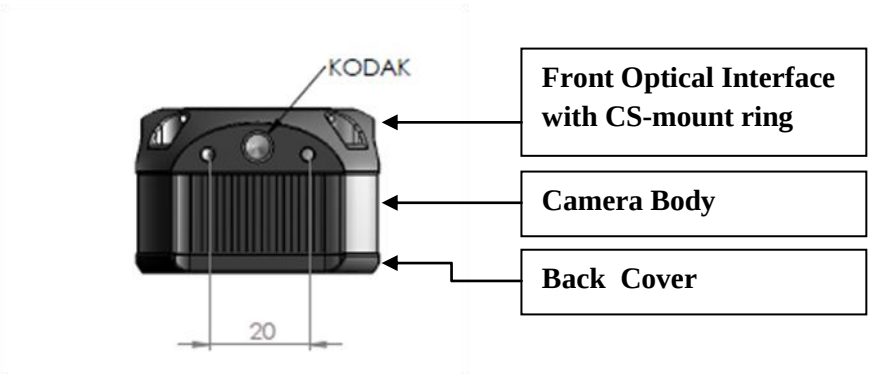

Figure 2 – Side view of WiDy SWIR 640U-S

(*) Camera is calibrated at factory. User can calibrate the camera with its own parameters but can restore factory calibration using BPM file and NUC factory file (See WiDyVISION manual).

An additional CS/C mount adaptor is systematically mounted on the camera for delivery.

3.2 Lens Mount

The front optical interface and the CS-mount ring are factory adjusted to guarantee a CS mount lens compatibility. For customers using a C mount lens, an additional ring, supplied with the camera, needs to be mounted prior to the lens.

However, in case of focus trouble, the CS-mount ring can be manually adjusted to be properly positioned with the sensor focal plane. This adjustment is done with a screw.

4 CAMERA INTERFACING

The WiDy SWIR 640U-S is powered and provides a digital 14 bits video flux trough a single mini USB 2.0 connector.

The camera parameters such as frame rate, Trigger control, NUC & BPM are controlled using the WiDyVISION software. Power supply is also available through the USB 2.0 connection.

A trigger input/output is available through the SMC connector. The trigger setting is controlled with the WiDyVISION software.

4.1 Power supply

The input power supply is available through the mini USB2.0 connector (MOLEX - 500075-1517). A standard USB voltage of 5V must be used for the camera.

Never use a voltage higher than 6V.

Figure 3 – USB2.0 connector

4.2 Digital video Output

The default video output is a digital 14 bits USB 2.0 output provided through the mini USB 2.0 connector

4.3 Trigger (SMC connector)

The trigger control is done through a SMC connector (MULTICOMP - 26-09-TGG). The trigger can be configured as an input (from external to camera) or as an output (from camera to external) /

The trigger input signal must be in the range of 0-3.3V.

Never use a voltage input higher than 3.3V

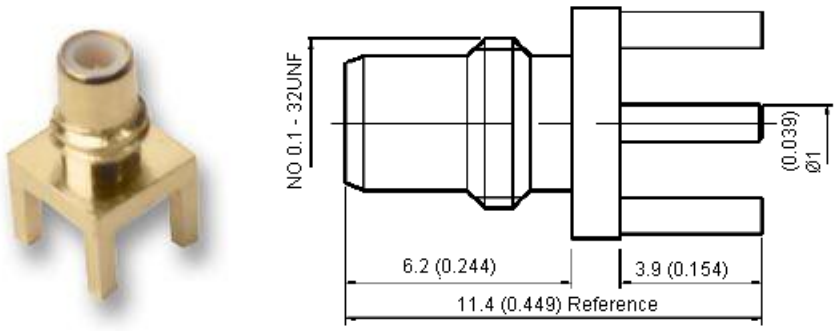

Figure 4 - SMC connector

5 COMMAND AND CAMERA CONTROL

5.1 Camera control

The following Camera controls can be accomplished through the USB connection with the WiDyVISION Software.

- Exposure time
- Trigger
- Frame rate

Important note: Operation mode of sensor (rolling or global) is automatically selected by camera once reference WiDy SWIR 320U, 640U, 640U-S is selected by user in starting menu.

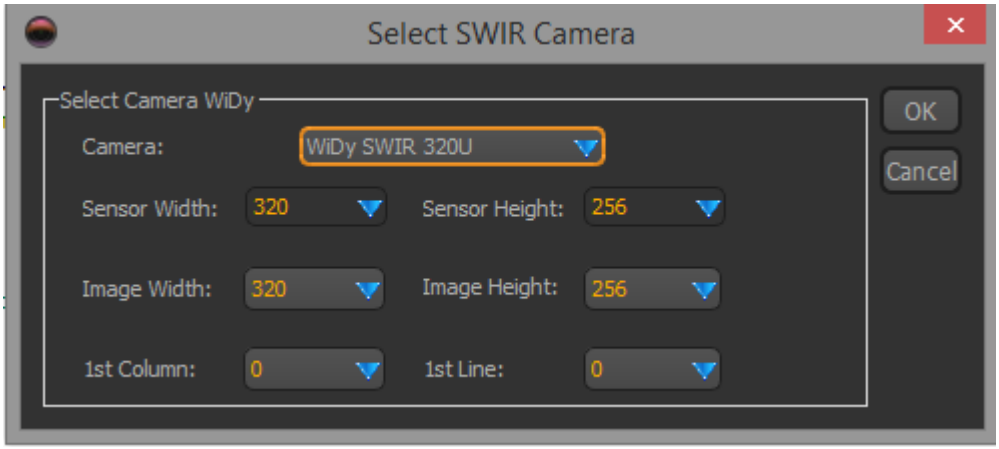

Figure 5 – starting menu WiDyVISION

5.2 Camera command

A set of key information about camera (sensor reference, resolution, serial number of camera, frame count, FPA temperature) is accessible in the tool bar.

For more information, refer to WiDyVISION software manual.

6 IMAGE PROCESSING

6.1 AGC / manual mode

By default the WiDySWIR 640 is programmed in AGC mode. This means displayed image is automatically optimized between 8 000 and 16 000 counts (RAW output of sensor is in differential analog converted into 14 bits). This function can be deactivated manually by clicking “manual settings”.

In manual settings, user can adjust by two slides the min and/or max values of displayed signal.

6.2 Zoom on displayed image

A digital 2x zoom is available for user by clicking check box.

6.3 Color and filtering

- Different menus for post processing display image (color, filter) are available for two different modes: AGC or manual settings.
- Histogram of image is accessible on the tool bar of GUI.

For more information, refer to WiDyVISION software manual.

7 NUC

The WiDy SWIR 640U-S you have purchased has been already calibrated in factory. When you will start the WiDyVISION software image displayed is pre-corrected at NIT factory (correction of bad pixels and 2 points calibration); the boxes “activate NUC” and “activate default BPR” are already ticked.

User can make its own 2 points NUC and/or BPR. This operation requires careful respect of procedure described in WiDyVISION software.

Important note: The serial number of camera is displayed at the foot of the tab of NUC. User must use different names for saving its own 2 points NUC and/or BPR.

For more information, refer to WiDyVISION software manual.

8 RECORDING

The WiDyVISION software allows to record still images (png, jpeg, bmp) or videos (ptw, avi) coming from camera. The image capture is accessible on the tool bar

For more information, refer to WiDyVISION software manual.

9 MECHANICAL DETAILS

9.1 Housing & Materials

The WiDY SWIR 640U-S is composed of 3 parts (front panel with CS-mount ring, body, back panel). All these parts are anodized aluminum with a black finish. An additional CS/C-mount adaptor is anodized aluminum with black finish is also supplied with camera.

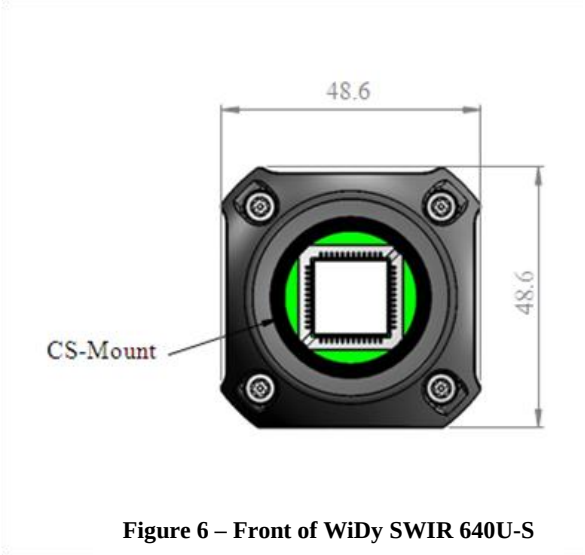

Figure 6 – Front of WiDy SWIR 640U-S

9.2 Dimensions

The WiDy SWIR 640U-S measures only

48.6 x 48.6 x 32.6 mm, hence making the camera perfect for small size OEM applications.

Dimensions are given in mm.

Figure 7 - WiDy 640U-S Dimensions (mm)

9.3 Lens and camera mounting

CS-mount ring is fully adjustable for back focus to support a wide variety of CS-mount lenses. A CS/C-mount adaptor is supplied with the camera to offer a compatibility with C-mount lenses. A Kodak 1/4 mounting hole is available for camera mounting and it can be used with a standard tripod mount.

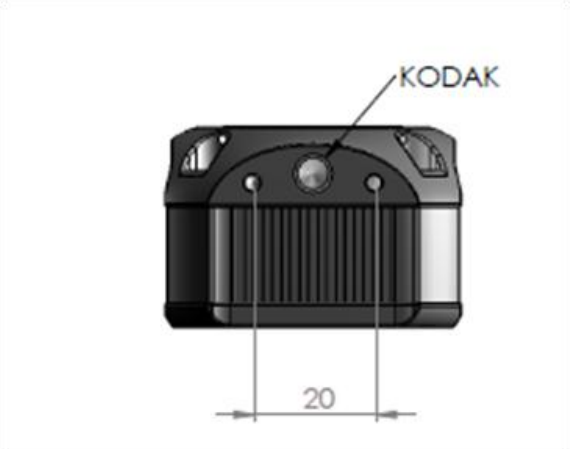

Figure - Kodak 1/4" mounting hole

10 CAMERA CARE

10.1 Maintenance and return.

The WiDy SWIR 640U-S is guaranteed for one year providing normal conditions of use. Therefore, the WiDy 640U-S camera should be handled with care. The camera should not be exposed to liquid or shock environments.

If an issue cannot be resolved, please contact New Imaging Technologies support at info@new-imaging-technologis.com. A returned Materials Authorization (RMA provided by NIT) may be used for the return. If the camera is under warranty, the camera will be repaired or replaced according to the terms of the warranty. If the camera is out of warranty, the repair will be quoted on an individual basis.

10.2 Electrostatic Discharge (ESD)

The WiDy SWIR 640U-S camera contains circuitry that can be damaged by electrostatic discharge. It is good practice to carry the camera in a static free container or bag. When the camera is not plugged in, the user should make sure that the working surface, and any tools used, are properly grounded.

10.3 Cover Glass Damage

The camera sensor has a protective cover glass over the sensor. If the lens mount is removed, this cover glass is exposed at the front of the camera. It can easily become scratched, soiled or damaged. It is especially difficult to remove oil from it, so avoid touching with fingers. It is best to keep the lens mount on the camera to reduce the risk of physical damage.

If the cover glass does get dirty or dusty, use clean, dry compressed air to blow away any dust. If further cleaning is required, use a lint-free, ESD safe soft cloth wipe and optical cleaning fluid (e.g. acetone liquid can be used).

10.4 Camera Housing

If the camera housing becomes dirty, a soft cloth with an isopropyl alcohol solution can be used.

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Pembroke Instruments

120 Stanford Heights Avenue
San Francisco, California USA 94127

Quotation

Date	Quotation No.
1/12/2015	08052013-108

Budgetary Quote
SWIR 640U and 320U

Ship To

Budgetary Quote
SWIR 640U and 320U

Terms
Due at Delivery

Item	Description	Qty	Unit Cost	Total
SWIR-640U-Global-...	• High QE InGaAs from 900nm-1.7µm, • VGA Resolution , 640 x 512 effective pixels, 15µm square pixels, 12.3mm diagonal • High Dynamic Range thanks to its patented Solar Cell pixel structure: 140 dB – no illumination saturation • Native WDR™: Intrinsic wide dynamic range - no knee points to setup – no multiple exposures – 140 dB in a single shot. • Single USB 2.0 output - compatible with Windows OS (driver Vista, 7.0, 8.0) • Ease of Use – Delivered with GUI WiDyVISION • Low power consumption and small form factor Sensor NSC1201-SI Resolution Operating Mode 640 x 512 pixels Global shutter (Snapshot) Materials InGaAs Pixel size 15um x 15um QE 80% Dimensions 49 x 49 x 33 mm Output USB 2.0 14bits Camera Interface USB 2.0 Dynamic Range >140dB – Log response Lens mount CS/C Mount Frame rate Up to 60fps Power Consumption <1,5W Operating Temp -40°C +70°C Weight <125 gr	1	19,750.00	19,750.00

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San Francisco, California USA 94127

Quotation

Date	Quotation No.
1/12/2015	08052013-108

Budgetary Quote
SWIR 640U and 320U

Ship To

Budgetary Quote
SWIR 640U and 320U

Terms
Due at Delivery

Item	Description	Qty	Unit Cost	Total
SWIR-320U-GS	• High QE InGaAs from 900nm-1.7µm, • VGA Resolution , 320X256 effective pixels, 25 µm square pixels, 12.3mm diagonal • Up to 140 fps, full frame • High Dynamic Range thanks to its patented Solar Cell pixel structure: 140 dB – no illumination saturation • Native WDR™: Intrinsic wide dynamic range - no knee points to setup – no multiple exposures – 140 dB in a single shot. • Single USB 2.0 output - compatible with Windows OS (driver Vista, 7.0, 8.0) • Ease of Use – Delivered with GUI WiDyVISION • Low power consumption and small form factor Sensor NSC1201-SI Resolution Operating Mode 320X256 pixels Global shutter (Snapshot) Materials InGaAs Pixel size 25um x 25um QE 80% Dimensions 49 x 49 x 33 mm Output USB 2.0 14bits Camera Interface USB 2.0 Dynamic Range >140dB – Log response Lens mount CS/C Mount Frame rate Up to 140 fps Power Consumption <1,5W Operating Temp -40°C +70°C	1	11,985.00	11,985.00

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Budgetary Quote
SWIR 640U and 320U

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Terms
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Item	Description	Qty	Unit Cost	Total
	Weight <125 gr			

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Budgetary Quote
SWIR 640U and 320U

Ship To

Budgetary Quote
SWIR 640U and 320U

Terms
Due at Delivery

Item	Description	Qty	Unit Cost	Total
Additional Charges	Customer will be additionally invoiced for applicable sales tax and shipping charges			

Phone #	Fax #	E-mail	Web Site
415-860-4217	415-585-0652	sales@pembrokeinstruments.com	http://www.PembrokeInstruments.com